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**Teck**

December 27, 2012

File No.: 01-773180-000

Dr. Laura C. Buelow  
Project Manager, Hanford/INL Project Office  
U.S. Environmental Protection Agency, Region 10  
309 Bradley Boulevard, Suite 115  
Richland, WA 99352


Subject: Upper Columbia River Remedial Investigation Feasibility Study (UCR RI/FS)  
Draft Final Version 2 *Fish Tissue Data Summary and Data Gap Report*  
(December 2012)

Dear Dr. Buelow:

On behalf of Teck American Incorporated, I am pleased to submit for your review and approval the above-referenced data summary report. The enclosed report has been revised in response to comments received on November 26, 2012 from the U.S. Environmental Protection Agency (EPA). To facilitate your review, we have attached EPA's comments and our associated responses (including the edits made within the report as appropriate). We wish to confirm that, as with all technical deliverables, an electronic version of the enclosed report will be posted on the secure domain of the project website in the very near future.

Should you have any questions or require any additional information at this time, please do not hesitate to contact me at (509) 623-4585.

Sincerely,  
**Teck American Incorporated**



Marko E. Adzic, P.E.  
Manager, Environmental Engineering



**HANFORD PROJECT OFFICE**

DEC 27 2012

**U. S. E P A**

Attachment – Response to EPA Comments on the UCR Fish Tissue Data Summary and Data Gap Report,  
November 2012

Enclosure – 1 hard copy (includes compact disc) *Final Fish Tissue Data Summary and Data Gap Report*  
(December 2012)

cc: Matt Wilkening, U.S. Environmental Protection Agency, Boise, ID, Enclosure (1)  
Monica Tonal, U.S. Environmental Protection Agency, Seattle, WA, Enclosure (1)  
John Roland, Department of Ecology, Spokane, WA, Enclosure (1, CD only)  
Patti Bailey, Colville Confederated Tribes, Nespelem, WA, Enclosure (1)  
Randy Connolly, Spokane Tribe of Indians, Wellpinit, WA, Enclosure (1, CD only)  
Dan Audet, National Park Service, Spokane, WA, Enclosure (1, CD only)  
Dr. Anne Fairbrother – Exponent, Inc., Bellevue, WA, Enclosure (1, CD only)



## EPA Comments on the UCR Draft Final Fish Tissue Data Summary and Data Gap Report

### General Comments (GCs)

**March 2012; GC-3** *This data summary report does not explicitly state, but seems to assume, that analytical reporting limits (RL) less than 10x the planned value are acceptable. Please explain why 10x the planned RL was used as a threshold criteria for acceptability. Please comment on the reason for exceedances of targeted RLs and the relevance of these deviations to data analyses. Is there a difference between 9.8x - 9.9x greater than the target RL and 10x the RL (see table 5-11). Deviations from the planned goals should be explained (as required by the QAPP), and the rationale for accepting 10x the target detection limit requires supporting discussion. The RLs were originally established based on assay requirements and method performance. As indicated in the QAPP (page D-2, section D2, Verification and Validation Methods) "ACGs and targeted MRLs for this task are provided in Table B-2. Any exceedance of actual MRLs over the target MRLs or ACGs will be discussed in the data validation report." Examples indicating where supporting text could be added are provided in the specific comments (e.g., SC-11, SC-16, SC-20, SC-27, and SC-29).*

**November 2012; EPA requires additional changes to address this comment.** Section 7 (pg. 7-1) concludes that "For most COIs, actual MDLs met the planned MDLs or were not greater than five times the ACGs". This statement is misleading. More than 65 analytes had MDLs that exceeded 5x the ACG, and there are few explanations why MDLs were not able to meet this 5x ACGs criterion. A partial exception is for chlordane, where the text (Section 5.6; Table 5-11) describes how "Elevated MDLs for total chlordane may be an issue" due to the high number of non-detects for this analyte. However, the reason for elevated chlordane MDLs greater than 5x the ACG and the planned MDL is not discussed. Nor does the text explain why the other 21 OC pesticides with planned MDLs also exceed the 5x ACG for one or more fish species (e.g., all but one methoxychlor) of the OC pesticides with planned MDLs had 5x ACG exceedances for one or more fish species; Table 5-11).

Additionally, in some cases (e.g., PBDEs; [Table 5-10]), MDLs for analytes were unknown and therefore, not included in the QAPP. The actual RLs were in some instances greater than 20x the target RL. Even though there is no MDL, the high reporting RLs need to be discussed.

**Comment Response.** We appreciate the comment and the opportunity to provide further clarification. It is important to note that if only one analysis for a given chemical of interest (COI) had an actual method detection limit (MDL) that exceeded the planned MDL or was greater than five times the analytical concentration goal (ACG); it was highlighted within the aforementioned tables (Tables 5-7 through 5-13). Highlighting within the aforementioned tables does not mean that all analyses associated with a given COI had actual MDLs that exceeded planned MDLs or was greater than five times the ACG. Furthermore, it is important to recall that because ACGs were conservatively set at one-fifth the fish and wildlife risk based concentration, or equal to the human health risk based concentration (whichever was lowest), nondetect samples that are at or below five times the ACG remain adequately sensitive for use in the RI/FS.

As detailed within Section 5 and reiterated within Section 7 of the revised draft final data summary report, with the exception of four (i.e., total chlorodane, hexachlorobutadiene, pentachlorophenol, and butyl benzyl phthalate) of the >340 COIs analyzed in the 2009 fish sampling program, actual MDLs for samples analyzed (even for 'highlighted' COIs) were largely at or below the planned MDL or no more than five times greater than the ACG. For instance, a small percentage (1.5 percent) of analyses for inorganic substances had actual MDLs greater than five times the ACG (due to laboratory blank contamination); while actual MDLs for 98.5 percent of all metals/metalloid analyses, were at or below the planned MDLs, or no more than five times greater than the ACG.

Due to chromatographic interference, MDLs for total chlorodane, hexachlorobutadiene, pentachlorophenol, and butyl benzyl phthalate did not meet planned MDLs and were often observed to be



greater than five times the ACG. Specifically, 71 percent and 64 percent of the analyses for total chlorodane and hexachlorobutadiene were respectively observed to have MDLs greater than five times the ACG. Despite actual MDLs meeting or not exceeding five times the ACG for the aforementioned organochlorine pesticides, 29-36 percent of time respectively, there is uncertainty associated with concentrations for these two COIs which will need to be considered during the risk assessment. Similarly, MDLs for the semi-volatile organic compounds pentachlorophenol and butyl benzyl phthalate, did not meet planned MDLs, due to chromatographic interference, and were observed to be greater than five times the ACG for all analyses. Therefore, there is uncertainty associated with these two COIs which will need to be considered during the risk assessment.

As discussed in Section 4.7.1 and 4.7.2 of the draft final summary report and detailed within validation reports (available on the "Downloads" page in the project database; <http://teck-ucr.exponent.com>), there were instances where samples exceeded the instrument calibration range for some polybrominated diphenylether (PBDE) compounds. This, in conjunction with trace-levels of PBDE contamination in equipment blanks, resulted in elevated MDLs and a concomitant data qualification. A summary of PBDE compounds affected by the above-mentioned laboratory issues are presented within Section 5.5. As discussed in Section 5.5, the resulting effect on PBDE analyses was that approximately 2 percent of all PBDE analyses completed for the 2009 Study had elevated MDLs. Although there is uncertainty associated with the absolute concentrations for these non-detectable PBDE congeners; this uncertainty is not anticipated to affect overall data quality as it represents a very small percentage of PBDE data, for which no human health or ecological risk-based concentrations are available.

We wish to confirm that Sections 5 and 7 have been updated to improve clarity and Tables 5-7 through 5-13 have once again been reviewed to ensure accuracy. We trust that these edits in association with those detailed in response to specific comment numbers 20, 25, 27, and 29 wholly address EPA's comment.

**March 2012; GC-5** *EPA received numerous comments, both from internal team members and our external partners requesting additional analysis and presentation of the analytical chemistry data. We struggled with how best to handle these comments. The desire for additional data analysis is entirely understandable since the preliminary human health and ecological risk assessments are still several years away. It seems that everyone, including our own staff, our project partners, and the general public wants to know what this data means. However, this data summary report is only intended to present the results of the sampling and determine whether data gaps exist that would warrant the immediate collection of additional data. Risks to people who eat fish and ecological risks will be analyzed and presented in the relevant risk assessment reports. Further analyses of the data, if needed (e.g., spatial trends, correlations between age and tissue concentrations, comparisons to previous data sets) will be presented in the Remedial Investigation Report. What this report needs to do is present, as clearly as possible, information about the samples collected and the biological and analytical measures collected for each fish and/or composite sample. The report must also point the reader to the project database and provide the information the reader would need to re-create the figures and summary information presented in the report. To address this general comment, Teck must:*

- c) Provide an example of a dioxin TEQ concentration calculation, used to develop the values presented in Figures 5-5 through 5-8. Include calculated TEQ values in the electronic data submitted with the report.*
- d) Provide an example of a PCB Fish TEQ concentration calculation, used to develop the values presented in Figures 5-9 through 5-12. Include the calculated PCB Fish TEQ values in the electronic data submitted with the report.*

**November 2012; EPA requires additional changes to address these two sections of this comment.**

Appendix M appears to be incomplete. Figures 5.5 through 5-12 illustrate the Toxic Equivalency Concentration (TEC; sometimes referred to as Toxic Equivalency or TEQ) for dioxins/furans and PCBs and contain a note referencing Appendix M for "specifics of the approach for calculating total concentrations of dioxins/furans [or PCBs, as appropriate]". Appendix M describes the procedure for calculating TECs, provides Toxic Equivalency Factors (TEFs) to perform the TEC calculation; lists



sources of TEFs, and provides an example TEC calculation. However, calculated dioxin and PCB TEC values were not presented in Appendix M and are only found in Appendix K-1 for the large fish. A table that includes the TEC values for all fish size classes is not provided within Appendix M or on either report CD.

The example calculation has been provided, but the RTCs state "TEQ values have been included within the above-mentioned Appendix [Appendix M]." This is not true. The calculated TEQs are not provided in Appendix M and are only provided for large fish in Appendix K.

**Comment Response.** As acknowledged within EPA's comment, Toxic Equivalency's (TEQs) along with the applicable toxicity equivalency factors for all fish sizes, feeding guilds, and/or species are illustrated within Figures 5-5 through 5-12. TEQ values used to generate the aforementioned figures have now been incorporated into Appendix M (i.e., Tables M-2 and M-3). As suggested by the titles of these tables [Table M-2 "Calculated Fish, Avian, and Mammalian Toxicity Equivalency Concentrations (TECs) for Fish Samples Analyzed for Dioxins/furans" and Table M-3 "Calculated Fish, Avian, and Mammalian Toxicity Equivalency Concentrations (TECs) for Fish Samples Analyzed for PCBs"]; they include reported concentrations for individual congeners in each sample, and calculated TEQ values for fish, birds, and mammals. We wish to confirm that the aforementioned tables have also been made available electronically (i.e., Excel files) and are included on the accompanying compact discs.

In addition, the sample calculation illustrating the computation of an avian TEC for dioxins/furans in a smallmouth bass (Table M-1a), has been expanded to include a similar computation of an avian TEC for PCBs, see Table M-1b. We trust that these updates wholly address EPA's comment.

### Specific Comments (SCs)

**March 2012; SC-14.** This section concludes with the statement that "Additional samples of large fish from other FSCAs (e.g., three sets of fillet and remainder samples for smallmouth bass from FSCA 3) were analyzed to supplement the total number of large fish samples from the UCR (Table 2-17)." While this may be true, analysis of extra fish from one FSCA may not address potential data gaps in another FSCA. **Add text to acknowledge this uncertainty. Also** see General Comment 2.

**November 2012; EPA requires additional changes to address this comment.** Two additional examples of large fish samples collected at different FSCAs have been added to the last paragraph of Section 6.1 on pg. 6-2. However, the uncertainty identified in the comment has not been added to the text. A statement is needed indicating that additional fish collected from one FSCAs may not address potential data gaps in another FSCA.

**Comment Response.** It should be noted that the above-listed "March 2012, SC-14" is inconsistent with EPA's original March 15, 2012 comment. The inconsistency has been identified above in **bold italic font**. It should also be noted that the draft final text simply stated that additional samples of large fish were analyzed to supplement the total number of fish samples. It did not allocate fish captured in one FSCA to another. Furthermore we wish to confirm that analysis of the aforementioned additional samples was consistent with EPA's direction.

Notwithstanding the above-mentioned, we wish to confirm that Section 6.1 has been updated to improve clarity of the available data for use in the risk assessments (which includes fish tissue data collected in 2005 by EPA). Specifically, the following text has been added:

"... As outlined above, there were instances in which capture rates for certain species within FSCAs fell short of planned rates. There were also instances in which capture rates within FSCAs exceeded planned rates for certain species (e.g., smallmouth bass). As a result, to supplement the above-listed shortages and consistent with EPA's direction, large fish captured in excess of planned rates within



adjacent FSCAs were also analyzed increasing the overall available data set. Specific examples in which capture rates exceeded planned rates, resulting in additional data are as follows:


- Smallmouth bass—Three sets of fillet and remainder samples from both FSCA 3 and FSCA 6
- Suckers—Five sets of fillet and remainder samples from FSCA 2 and 8 sets of fillet and remainder samples from FSCA 4.

Despite satisfying and often exceeding design sampling efforts, capture rates for certain species of large fish within some FSCAs did not meet planned capture rates. Nevertheless, these data in conjunction with data collected in 2005 (USEPA 2007) are anticipated to provide adequate fish tissue concentration data for use in the risk assessment.”

We would like to take this opportunity to remind EPA that the aforementioned capture rates were not a study data quality objective, but rather represent an EPA approved level-of-effort approach (i.e., either we reached the planned collection target or we stopped after three days of trying, whichever came first). We trust that incorporation of the above text and additional clarity wholly addresses EPA’s comment.

**March 2012; SC-15.** The last paragraph in this section is difficult to understand. Please revise this paragraph to convey the intent more clearly and directly.

**November 2012; EPA requires additional changes to address this comment.** The previous two paragraphs describe the shortages from each FSCA for the particular size class of fish, however this paragraph transitions to describing what was caught, not where there are shortages. This paragraph needs to be written like the previous two paragraphs.

 **Comment Response.** Comment acknowledged. We wish to confirm that the paragraph has been restructured for consistency with the previous two paragraphs and to improve clarity. Specifically the text has been modified as follows:

“Shortages of large (>30 cm) fish fillet and remainder composite samples were as follows:

- Burbot—Five sets of fillet and remainder samples from FSCA 1, 3 sets of fillet and remainder samples from FSCA 2, and 1 set of fillet and remainder samples each from FSCAs 3 and 6
- Kokanee—One set of fillet and remainder samples from FSCA 6
- Whitefish—Three sets of fillet and remainder samples from FSCA 1, 2 sets of fillet and remainder samples each from FSCAs 2 and 5, and 6 samples from FSCA 6
- Suckers—Three sets of fillet and remainder samples from FSCA 1, 1 set of fillet and remainder samples from FSCA 3, and 2 sets of fillet and remainder samples from FSCA 5
- Smallmouth bass—Six sets of fillet and remainder samples from FSCA 1, 5 sets of fillet and remainder samples from FSCA 2, 4 sets of fillet and remainder samples from FSCA 4, 3 sets of fillet and remainder samples from FSCA 5
- Walleye—One set of fillet and remainder samples from FSCA 1.

As outlined above, there were instances in which capture rates for certain species within FSCAs fell short of planned rates...”

We trust that incorporation of the above text wholly addresses EPA’s comment.

**March 2012; SC-20.** It is not necessarily agreed that all samples were analyzed according to the QAPP since RL objectives were not met. It is also not true that actual RIs were “not greater than 10 times the



planned RLs' as stated. Please revise these statements to indicate that actual RLs for some COIs were greater than 10 times the planned RLs. Please also see General Comment 3.

**November 2012; EPA requires additional changes to address this comment.** It is misleading to say that "For most COIs, actual MDLs met the planned MDLs or were no greater than five times the ACGs." There were over 65 analytes with MDLs still exceeding 5x the ACG.

**Comment Response.** Further to the updates detailed in response to GC-3, Section 7 of the data summary report has been modified to clarify that for most samples (i.e., 98 percent) actual method detection limits did in fact meet planned method detection limits or were no greater than five times the conservatively established analytical concentration goal. To improve clarity within this section the text has been modified as follows:

"...For most samples (i.e., 98 percent), actual MDLs met the planned MDLs or were no greater than five times the ACGs. Four COIs (i.e., total chlorodane, hexachlorobutadiene, pentachlorophenol, and butyl benzyl phthalate) had a high percentage (ranging from 64 to 100 percent of the analyses) of non-detects for which actual MDLs did not meet planned MDLs or were five times greater than the ACG due to chromatographic interference. As a result, there is uncertainty associated with the concentrations for these four COIs."

As a result, of the >300 COIs analyzed for the 2009 fish tissue program, four had a high percentage of non-detects for which actual method detection limits did not meet planned method detection limits or were five times greater than the ACG. We trust that incorporation of the above text and additional detail as described in response to GC-3 wholly addresses EPA's comment.

**March 2012; SC-22.** Please indicate (e.g., highlight, bold, or footnote) sample classes where the target number of samples were not achieved in Table 2-17.

**November 2012; EPA requires additional changes to address this comment.** The comment response indicates that cells have been highlighted, however there are no highlights on Table 2-17.

**Comment Response.** Contents of Table 2-18 (formerly 2-17 in the draft August 2010) have been highlighted accordingly. We trust that this edit wholly addresses EPA's comment.

**March 2012; SC-26.** Ensure that data in the tables are highlighted as indicated. The selenium RL range for longnose sucker should be highlighted in Table 5-4. It is listed as (0.09-1.9 mg/kg) and is greater than 10x the laboratory RL (0.1 mg/kg). The Smallmouth Bass RL range is listed as 0.09-1.52 mg/kg, which is less than 10x the target RL (0.1 mg/kg) so it should not be highlighted.

**November 2012; EPA requires additional changes to address this comment.** The updates to the tables are appreciated; however explanations as to why the actual RLs are much higher than the target RLs are needed. See EPA's response to GC-3.

**Comment Response.** Comment acknowledged. It should be noted that the above-listed "March 2012; SC-26" is actually SC-25 as provided to Teck American Incorporated in March 2012, and that the above-referenced Table 5-4 was applicable for the draft August 2010 version of the report. Since then and as presented in draft final April 2012 version, materials presented in the aforementioned table are now detailed within Table 5-7 "Comparison of Analytical Concentration Goals and Method Detection Limits to Actual Detection Limits for Metals and Metalloids".

As noted in Section 4.6 of the report, laboratory and/or equipment blank contamination resulted in a small percentage (1.5 percent) of inorganic substances (i.e., metals/metalloids) having elevated actual method detection limits. We wish to confirm that this explanation for the elevated actual MDLs (laboratory blank contamination) has been incorporated into text of Section 5.1 too. We also wish to confirm that information within Table 5-7 was once again reviewed to ensure accuracy. It should be noted that any



and all data validation reports used in summarizing results presented within the data summary report are available on the "Downloads" page in the project database (<http://teck-ucr.exponent.com>) for all data users. We trust that this edit in association with those detailed in response to GC-3 wholly address EPA's comment.

**March 2012; SC-27.** Actual RL's for organochlorine pesticide congeners measured in Kokanee tissue range up to 10x the planned RL. Many other analytes have actual RL ranges almost 10 times greater than the target RL. Please comment on the reason for these exceedances of targeted RLs and the relevance of these deviations to data analyses. See general comment 3.

**November 2012; EPA requires additional changes to address this comment.** The updates to the tables are appreciated; however explanations as to why the actual RLs are much higher than the target RLs are needed. See EPA's response to GC-3.

*OK* **Comment Response.** Comment acknowledged. As detailed within Section 4.8 of the draft final report, observed elevated method detection limits for organochlorine pesticides are the result of blank contamination and/or chromatographic interference. We wish to confirm that this language has been incorporated within Section 5.6 of the draft final report. It should be noted that with the exception of total chlorodane and hexachlorobutadiene, which were respectively observed to have elevated method detection limits in 71 percent and 64 percent of analyzed samples; actual method detection limits for other organochlorine pesticides were at or below the planned MDL or no more than five times greater than the ACG in  $\geq 76$  percent of all analyses. Information within Table 5-11 was once again reviewed to ensure accuracy. We trust that these edits in association with those detailed in response to GC-3 wholly addresses EPA's comment.

**March 2012; SC-29.** All upper range values are listed at or above 10x the planned RL for Largescale Sucker. Please comment on the reason for these exceedances of targeted RLs and the relevance of these deviations to data analyses. See general comment 3.

**November 2012; EPA requires additional changes to address this comment.** The updates to the tables are appreciated; however explanations as to why the actual RLs are much higher than the target RLs are needed. See EPA's response to GC-3.

*OK* **Comment Response.** Comment acknowledged. As detailed within Section 4.9 of the draft final report, observed elevated method detection limits for semi-volatile organic compounds are the result of chromatographic interference. We wish to confirm that this language has been incorporated within Section 5.8 of the draft final report. It should be noted that with the exception of pentachlorophenol and butyl benzyl phthalate, which were observed to have elevated method detection limits in 100 percent of analyzed samples; actual method detection limits for other semi-volatile organic compounds were predominantly at or below the planned MDL or no more than five times greater than the ACG, refer to Section 5.8. We trust that these edits in association with those detailed in response to GC-3 wholly addresses EPA's comment.

*P 5-5 typo SX76*

*"High quality for use in R.A."*